Construction Completion Report

Beal Mountain Mine
Pond Removal and Run-On Control
Reclamation Project
Silver Bow County, Montana

Prepared for:

Montana Department of Environmental Quality

Abandoned Mine Lands Bureau
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1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) received Task No. 57, pursuant to DEQ Contract No. 407036, from the Montana Department of Environmental Quality (DEQ), Abandoned Mine Lands Bureau to complete a reclamation design, prepare a construction bid document package (Contract Documents), and provide administrative and technical support for the Beal Mountain Mine Pond Removals and Run-On Control Reclamation Project (Project). This construction report includes documentation of the construction activities implemented during the Project.dr

1.1 PROJECT LOCATION

The Beal Mountain Mine is located in the headwaters of German Gulch in the Pioneer Mountains, Silver Bow County, Montana, approximately 16 miles west southwest of Butte and 10 miles southwest of Fairmont (Gregson) Hot Springs (site). The general site location and diversion channel location are displayed in the As-Built Drawings provided in **Appendix A**.

1.2 GOALS AND OBJECTIVES

The goal of the Project was to take positive incremental actions toward returning the area to its pre-mining multiple use status.

Specific Project objectives include:

- Promote highwall stability by constructing surface water diversions and run-on controls above the Main Beal Pit to reduce infiltration into a geotechnically unstable area in the pit highwall known as the “clay/sill slide.”
- Reclaim three (3) pond facilities (Minnesota Pond, located on Minnesota Ridge, and the Stormwater and Contingency Ponds, located adjacent to German Gulch) to restore pre-mining topography and to reduce operations and maintenance costs at the site.

The purpose of this report is to summarize the construction activities of the Project.

1.3 PROJECT DESCRIPTION

The Beal Mountain Mine completed open pit mining operations in 1997 and gold recovery from the heap leach pad in 1999, with reclamation of the mine disturbance continuing through 2003. With a filing of bankruptcy in 1998, and exhaustion of bonding funds to compete reclamation, the United States Department of Agriculture – Forest Service (USDA-FS), in cooperation with DEQ, became the lead agency responsible for final mine closure. As the land management agency, the USDA-FS placed the mine closure under its CERCLA (Comprehensive Environmental Responsibility, Compensation, and Liability Act) authority and determined that the non-time-critical removal action process would be followed for mine closure. The USDA-FS goal for the site is to close the mine and allow the area to return to multiple use status.

The Project consisted of the following work items:

1. Removal of the Minnesota Pond, including pond dewatering, debris removal/disposal, and regrading of the Pond surface.

2. Removal of the Stormwater Pond, including debris removal/disposal and regrading of the Pond surface.
3. Removal of the Contingency Pond, including debris removal/disposal and regrading of the Pond surface.
4. Placement of imported cover soil at the Stormwater and Contingency Pond work areas.
5. Removal of the check-dam in German Gulch and restoration of the stream channel.
6. Construction of a lined run-on control ditch to intercept flows above the main Beal Pit highwall and divert them away from the clay/sill slide area.
7. Revegetation of all areas disturbed by construction. Each area was fertilized, seeded, and covered with biodegradable erosion control mat.

1.4 CONSTRUCTION PLANS AND SPECIFICATIONS

The Project plans (Tetra Tech, 2012) consisted of nine (9) plan sheets included in **Appendix C**. As part of the Contract Documents, construction specifications were developed as Special Provisions and Technical Specifications.

2.0 PRECONSTRUCTION

2.1 BID AWARD AND PRECONSTRUCTION CONFERENCES

On July 18, 2012, sealed construction bids were opened at the Last Chance Gulch DEQ office in Helena, MT. The low bidder was Schnell Excavation, Inc. (Schnell), of Butte, MT with a bid of $68,049.66, including Alternative Bid Item 1, Run-On Controls. Three (3) other contractors submitted bids with prices of $81,436.10, $168,000.00, and $186,826.16. The bid tabulations are included as **Appendix B.** The contract was awarded to Schnell and the Notice of Award was issued on July 27, 2012. Contract related documents including the Notice of Award are presented in **Appendix C**.

A preconstruction meeting was held on August 9, 2012, at the Fairmont Hot Springs parking lot. Attending were representatives from Schnell, DEQ, USDA-FS, and Tetra Tech. The conference included a general discussion on the contractors bid price, site access, contractor's equipment, proposed Project approach and schedule, estimated startup date, work hours, Project construction oversight, key personnel, contract documents, Project health and safety, and overall Project priorities. During the meeting it was emphasized that German Gulch Road would be used as the main access road to the site and the private road through Dave Smith's property would only be used to transport equipment and materials to and from the site. The preconstruction meeting minutes are provided in **Appendix D**.

2.2 CONTRACTOR PERSONNEL

The following were key personnel for Schnell for the Project:

- Project Manager and Construction Superintendent: Larry Schnell
- Project Quality Control Manager: Larry Schnell
- Project Health and Safety Manager: Larry Schnell

2.3 QUALITY ASSURANCE (QA)

Tetra Tech was responsible for the engineering design and preparing the Contract Documents. General construction oversight and contract administration was conducted by USDA-FS, Tetra Tech and DEQ. Dan Brown and Associates provided construction staking for the run-on control ditch and topographic surveys of the reclaimed ponds for volume calculations. The following personnel were involved in the Project QA:

DEQ:	Pebbles Opp, Project Manager
USDA-FS:	Sonny Thornborrow, Resident Project Representative (Construction Inspector)
Tetra Tech:	Michael Hatten, Project Engineer
Brown and Associates:	Dan Brown, Project Surveyor Chad Ball, Project Surveyor

3.0 CONSTRUCTION

DEQ issued the Notice of Award to Schnell on July 27, 2012. The Notice to Proceed was issued on August 9, 2012, requiring work to begin no later than August 14, 2012. Equipment inspection and mobilization to the site began on August 13, 2012. Construction of the Project began on August 14, 2012, with a Contract Time of 30 consecutive calendar days, in accordance with the Contract Documents. A total of 42 additional contract days were added as described in Section 3.3.1 of this report.

Reclamation of the Minnesota Pond began on August 14, 2012, with dewatering of the Pond and removal of the perimeter fencing. Material originally excavated for Pond construction was then regraded to match the pre-mining topography as shown on Sheet 3 of the as-built drawings, **Appendix A**.

Work was then initiated concurrently at the Stormwater and Contingency Ponds. Schnell regraded a portion of the Stormwater Pond but chose to leave some material for potential use as backfill at the Contingency Pond in the event there was a deficit of material there. Work then focused on the Contingency Pond with removal of the pond liner and fencing materials. On August 23, 2012, Work Directive Change No. 2 was signed. This added removal of the check dam associated with the Contingency Pond and restoration of the German Gulch stream channel. Pond regrading and stream channel restoration work was completed on September 5, 2012.

Schnell then returned to the Stormwater Pond and regraded some of the material intentionally left there. Excavation of the run-on control ditch started on September 12, 2012. Liner was placed in the ditch on September 27, 2012. Imported cover soil was used as vegetative backfill in the ditch which was then fertilized, seeded, and covered with turf-reinforcement mat.

After completing the run-on control ditch, Schnell returned to the Stormwater Pond and continued regrading until the surface was acceptable to the QA team. Finally, seeding and fertilizing was completed by subcontractor Ueland-Western Reclamation. Schnell finished the Project by installing erosion control mat over all disturbed areas. **Table 1** lists construction milestones accomplished during the Project.

TABLE 1
Construction Milestones

Milestone	Date
Bid Opening	July 18, 2012
Notice of Award	July 27, 2012
Notice to Proceed	August 9, 2012
Construction Startup	August 14, 2012
Completion of Minnesota Pond Regrading	August 21, 2012
Completion of German Gulch Check Dam Removal and Stream Restoration	August 29, 2012
Completion of Contingency Pond Regrading	September 5, 2012
Completion of Run-On Control Ditch Excavation	September 24, 2012
Completion of Run-On Control Ditch liner installation, vegetative backfill, and TRM installation	October 4, 2012
Completion of Stormwater Pond Regrading	October 4, 2012
Completion of cover soil placement at Stormwater and Contingency Ponds	October 11, 2012
Completion of fertilizing and seeding at Minnesota, Stormwater, and Contingency Ponds	October 17, 2012
Completion of erosion control mat installation	October 23, 2012
Contractor's Certificate of Completion	October 25, 2012
Final Inspection	October 25, 2012
Certificate of Acceptance	November 2, 2012

Daily construction logs and photographs detailing construction activities are included in **Appendix E**. In addition to the construction logs, a table summarizing construction equipment is also included in **Appendix E**. Additional Project photographs are included electronically in **Appendix J**.

3.1 CONSTRUCTION MANAGEMENT

A functional line of communication was established between Schnell and the QA team. Routine communication was verbal or through email. Change orders and design modifications were documented by written communication and submittals were handled through a standard engineer review process.

3.1.1 Communication with Contractor

Most communication with Schnell was handled informally and the need for written communication was limited to work directives and change orders.

3.1.2 Submittals

Submittals were handled in accordance with standard engineer review. **Table 2** lists Project submittals with dates submitted and dates approved for the Project. Copies of the material submittals are found in **Appendix F**.

TABLE 2
Project Submittals

Submittal	Date Received	Date Approved
HAZWOPER Certs	8/7/2012	8/7/2012
Health and Safety Plan	8/7/2012	*
Construction Schedule	8/7/2012	8/7/2012
Contractor Documents and Resumes	8/7/2012	8/7/2012
Dust, Traffic, Weed, SWECP Plans	8/7/2012	8/7/2012
List of Subcontractors	8/7/2012	8/23/2012
Quality Control Plan	8/7/2012	8/7/2012
Imported Cover Soil	9/21/2012	9/25/12
Straw Wattles	8/15/2012	8/15/2012
Turf Reinforcement Mat	8/15/2012	8/15/2012
Erosion Control Mat	8/15/2012	8/15/2012
60-mil Geomembrane Liner	8/15/2012	8/15/2012
Revised Construction Schedule	9/28/2012	9/28/2012
Seed Submittal	10/17/2012	10/18/2012
Fertilizer Submittal	10/17/2012	10/18/2012

*Neither Approved or Disapproved

3.1.3 Weather Days

No weather days were requested for the Project.

3.1.4 Project Closeout

Construction of the Project was completed on October 23, 2012. The Contractor's Certificate of Completion was executed on October 25, 2012. The Certificate of Acceptance for the Project was executed on November 2, 2012. **Appendix G** contains copies of the Contractor's Certificate of Completion, Affidavit on Behalf of Contractor, Consent of Surety Company to Final Payment, and Certificate of Acceptance.

3.2 DESCRIPTION OF DESIGN CHANGES DURING CONSTRUCTION

In general, construction was accomplished according to plan; however, noteworthy changes to the design are described below. Construction components are displayed in the As-Built Drawings included in **Appendix A**.

3.2.1 Run-On Control Ditch Alignment Change – Centerline and Vertical Control Adjustments

On August 13, 1012, Brown and Associates (Brown) attempted to stake the run-on control ditch according to the channel alignment table on Sheet 9 of the Contract Documents. Once in the field, Brown encountered serious discrepancies between the elevations in the channel alignment table and the true elevations on the ground. Additionally, the horizontal alignment (i.e. channel centerline) was situated in the middle of the access road. Due to these problems, a decision was made by the QA team to move the centerline of the ditch to the toe of the road cut slope. Additionally, no cut and fill staking was completed because the channel centerline had been moved and the vertical controls were unusable. Therefore, Schnell was instructed by the

QA team to "field-fit" the ditch using the typical drawing shown on Sheet 7 of the Contract Documents as a guide. Ultimately, the field fitting process resulted in a ditch that was different from the design. The constructed ditch is generally shallower than the typical drawing and does not have the gradient depicted on the design drawing. This design change is displayed on Sheet 6 of the As-Built Drawings (**Appendix A**).

3.2.2 Quantities Completed

Work items were bid on a lump sum and unit price basis. Payment was made based on the actual quantity of each bid item completed. **Table 3** displays the bid items, bid item unit prices, units of measurement, and estimated and actual quantities. Actual quantities were determined by construction oversight personnel and topographic surveys.

TABLE 3
Quantities Completed

BID ITEM QUANTITIES						
Bid Item	**Description**	**Unit**	**Unit Price**	**Estimated Quantity**	**Actual Quantity**	**Quantity Difference**
1	Mobilization, Demobilization, Bonding, and Insurance	LS	$3943.00	1	1	0
2	**Minnesota Pond Removal**					
2-A	Pond Dewatering	LS	$500.00	1	1	0
2-B	Debris Removal and Disposal	Ton	$125.00	4	13.9	9.9
2-C	Strip and Stockpile Topsoil	CY	$15.00	150	179	+29
2-D	Regrade Pond Area	CY	$2.00	3900	3702	-198
2-E	Replace and Grade Topsoil	CY	$10.00	150	179	+29
2-F	Fertilize and Seed	AC	$723.60	1.25	0.98	-0.27
2-G	Erosion Control	SY	$1.98	5111	4731	-380
2-H	Straw Wattles	LF	$2.30	290	0	-290
3	**Storm Water Pond Removal**					
3-A	Remove and Stockpile Riprap	LS	$400.00	1	1	0
3-B	Debris Removal and Disposal	Ton	$400.00	0.5	0	-0.5

3-C	Regrade Pond Area	CY	$2.00	1435	839	-596
3-D	Fertilize and Seed	AC	$723.60	0.5	0.5	0
3-E	Erosion Control	SY	$1.98	2138	2542	+404
3-F	Straw Wattles	LF	$2.30	365	392	+27
4	**Contingency Pond Removal**					
4-A	Debris Removal and Disposal	Ton	$134.00	3	9.5	+6.5
4-B	Regrade Pond Area	CY	$2.00	700	1202	+502
4-C	Fertilize and Seed*	AC	$723.60	0.5	0.7	+0.2
4-D	Erosion Control*	SY	$1.98	1784	3286	+1502
4-E	Straw Wattles	LF	$2.30	260	357	+97
Alternative 1	**Run-On Controls**					
A-1	Regrade Access Road	LS	$500.00	1	1	0
A-2	Excavate Run-On Control Ditch	CY	$18.67	150	209	+59
A-3	Run-On Control Ditch Construction	LF	$33.13	634	607	-27
A-4	Fertilize and Seed	AC	$723.60	0.5	0.11	-0.4
WORK DIRECTIVE QUANTITIES						
Work Item No.	**Work Directive No. 2, Check Dam Removal**					
1	Clear and Grub	LS	$900.00	1	1	0
2	Check Dam Dewatering	LS	$2200.00	1	1	0
3	Check Dam Sediment Removal and Regrading	LS	$3000.00	1	1	0
4	Check Dam Structure Removal	LS	$1200.00	1	1	0

5	Channel Replacement	LF	$116.00	66	73	0
6	Access Road Reclamation	CY	$227.00	30	30	0
Work Item No.	**Work Directive No. 4, Imported Cover Soil**					
Storm Water Pond, Contingency Pond, and Check Dam Removal Area		CY	$21.00	601	760	+159

*Includes check dam removal work area (Work Directive Change No. 2)

Notable bid items that varied significantly from the estimated bid quantity are described below:

Bid Item 2-B, Debris Removal and Disposal at Minnesota Pond – this bid item was significantly higher than the estimate due to a larger amount of debris encountered and removed from the Minnesota Pond.

Bid Item 2-H, Straw Wattles at Minnesota Pond – no wattles were installed at the Minnesota Pond because of very low potential for erosion and because there are no live water sources near the Pond.

Bid Item 3-B, Debris Removal/Disposal at Stormwater Pond – Schnell agreed to consolidate the small amount of debris from this Pond with a load of debris from the Contingency Pond and not request payment for this item.

Bid Item 4-A, Debris Removal and Disposal at Contingency Pond - this bid item was significantly higher than the estimate because it includes debris that was removed at the check dam removal work area

Bid Item 4-B, Regrade Pond Area at Contingency Pond – this bid item was significantly higher than the estimate because it includes additional regrading for the check dam removal work area.

Bid Item 4-D, Erosion Control Mat at Contingency Pond – this bid item was significantly higher than the estimate because it includes erosion control mat placed at the check dam removal work area.

Bid Item A-4, Fertilize and Seed Run-On Control Ditch – the amount of disturbance at the run-on control ditch work area was much less than anticipated in the engineering design.

3.3 PROJECT COSTS

Schnell's base bid for the Project contract was $68,049.66. A total of five (5) work directives were issued for the Project which added work to the contract. These changes, in combination with the reconciliation of the contract quantities, increased the overall contract price by $53,603.82. The total Project construction contract price was $121,653.48. Actual amount paid to Schnell was $120,436.94 after a 1% tax withholding of $1,216.54. Two payments were made to Schnell. These payment requests are presented in **Appendix H**.

3.3.1 Work Directive Changes

Five (5) work directive changes were approved for the Project.

- **Work Directive Change No. 1** - Added the supply and transport of 60 cubic yards of imported cover soil to the run-on control ditch construction area. This change was done in order to provide better quality vegetative backfill for Bid Item A-3, Run-on Control Ditch Construction.

- **Work Directive Change No. 2** - Added the German Gulch Check Dam Removal and Access Road Reclamation work. This change was done in order to fully reclaim the area surrounding the Contingency Pond.

- **Work Directive Change No. 3** - Added additional mobilization costs for Schnell to return equipment to the Stormwater Pond and finish regrading the area. During construction there were two (2) instances where Schnell determined they had finished regrading the Pond as depicted on Sheet 4 of the Contract Documents. The first occasion was on August 24, 2012, when Schnell moved equipment from the Stormwater Pond to the Contingency Pond. The Resident Project Representative (RPR) was not on-site that day to advise Schnell that the Stormwater Pond regrading was unacceptable. Following this incident, Schnell on September 7, 2012, returned to the Stormwater Pond and completed additional regrading work. However, the RPR was once again not on-site and Schnell moved their equipment before the work was inspected. Following inspection on September 11, 2012, it was determined the work was still insufficient despite the additional regrading. Therefore, Schnell was requested to return to the Stormwater Pond for a third time to complete the regrading work. Additional compensation for re-mobilizing a third time was agreed upon by the QA team.

- **Work Directive Change No.4** - Added the supply, transport, and placement of 760 cubic yards of imported cover soil on the Contingency and Stormwater Ponds. The purpose of this change was to increase the success of revegetation efforts. No topsoil was stockpiled at the time of initial pond construction and therefore the topsoil on the regraded ponds was of poor quality.

- **Work Directive Change No. 5** - Added regrading of a portion of the site access road. This change was done in order to provide a suitable driving surface for trucks delivering the imported cover soil.

Table 4 gives a summary of each work directive change. Copies of the work directives are provided in **Appendix I**.

TABLE 4
WORK DIRECTIVE CHANGE SUMMARY

No.	Date of Issuance	Reason	Change in Contract Time	Estimated Change in Contract Price	Actual Change in Contract Price
1	8/23/2012	Work Directive No. 1: Supply and transport 60 cubic yards of cover soil for vegetative backfill in the run-on control ditch.	1 day	$900.00	$900.00
2	8/23/2012	Work Directive No. 2: German Gulch Check Dam Removal and Access Road Reclamation	14 days	$21,766.00	$21,766.00
3	9/14/2012	Work Directive No. 3: Remobilize equipment to the Stormwater Pond	3 days	$400.00	$400.00
4	9/28/2012	Work Directive No. 4: Supply, transport, and place cover soil at the Stormwater and Contingency Ponds	8 days	$22,121.00	$25,460.00
5	10/4/2012	Work Directive No. 5: Regrade Access Road	1 day	$500.00	$500.00
TOTAL				**-**	**$49,026.00**

3.3.2 Change Orders

Three (3) change orders were approved for the Project.

- **Change Order No. 1** – Included costs for changes under Work Directive Change Nos. 1, 2, and 3. This change order added 18 calendar days to the contract time to account for the additional work and added $23,066.00 to the contract price.

- **Change Order No. 2** – Included costs for changes under Work Directive Change Nos. 4 and 5. This change order added nine (9) calendar days to the contract time to account for the additional work and added $25,960.00 to the contract price.

- **Change Order No. 3** – Reconciled the contract quantities, added 15 calendar days to account for delays in scheduling the seeder subcontractor, and added $4,577.82 to the contract price.

Table 5 gives a summary of each change order. Copies of the change orders are provided in **Appendix I.**

TABLE 5
CHANGE ORDER SUMMARY

No.	Date Executed	Reason	Change in Contract Time	Change in Contract Price
1	9/26/2012	Incorporated Work Directive Change Nos. 1, 2, 3 work and costs into the contract	18	$23,066.00
2	11/2/2012	Incorporated Work Directive Change Nos. 4 and 5 work and costs into the contract	9	$25,960.00
3	11/2/2012	Reconciled the contract quantities and associated change in bid item costs into the contract	15	$4,577.82
TOTAL			**42**	**$53,603.82**

3.3.3 Total Project Costs

As discussed above, construction costs for the Project totaled $121,653.48, including change orders. The cost for engineering reclamation design, Contract Document preparation, and construction surveying totaled $24,415.16, which results in a total DEQ Project cost of $146,068.64. An analysis of DEQ's engineering and construction costs for the Project is presented in **Table 6**.

TABLE 6
Analysis of Engineering and Construction Costs

Engineering Services	Amount	Percentage of Total Construction Costs	Percentage of Total Project Costs
Task Order No. 57. DEQ Contract No. 407036. Reclamation Design, Contract Document Preparation, Construction Surveying (Tetra Tech)	$24,415.16	20.1%	16.7%
Construction Oversight (USDA-FS)*	Paid by USDA-FS		
Construction Engineering Support and Administration**	Paid by USDA-FS		
Construction Completion Report (Tetra Tech, USDA-FS, DEQ)***	Paid by USDA-FS		
Total Engineering Costs, DEQ	**$24,415.16**	**20.1%**	**16.7%**
Construction Services	**Amount**	**Percentage Of Total Construction Costs**	**Percentage Of Total Project Costs**
Schnell Excavation, Inc. (Contract 413006)	$68,049.66	55.9%	46.6%
Change Orders	$53,603.82	44.1%	36.7%
Total Construction Costs	**$121,653.48**	**100.0%**	**83.3%**
Total Project Costs (Engineering + Construction)	**$146,068.64**	**-**	**100.0%**

*Construction oversight was provided by USDA-FS personnel.
** USDA-FS paid for all construction engineering services.
***Construction Completion Report was prepared jointly by USDA-FS, DEQ, and Tetra Tech personnel. USDA-FS paid for all Construction Completion Report preparation engineering services.

4.0 QUALITY ASSURANCE

Construction quality control (QC) was the responsibility of Schnell and QC requirements were identified in the Contract Documents. Due to the limited scope and nature of the Project QC requirements were minimal.

Quality assurance (QA) was conducted by Tetra Tech to assure standards presented in the construction drawings and specifications were met. The main QA activities conducted during construction included the following verification:

- Verified all pond debris was removed and disposed of in accordance with the Contract Documents;
- Verified pond reclamation construction in accordance with the Contract Documents;
- Verified run-on control ditch construction in accordance with the Contract Documents and Engineer's direction;
- Verified German Gulch stream channel construction in accordance with the Contract Documents.
- Verified fertilize and seed requirements in accordance with the Contract Documents.
- Verified all materials provided to the Project (straw wattles, turf reinforcement mat, erosion control mat, 60-mil geomembrane liner) were in accordance with the contract specifications and contractor submittals.

5.0 ISSUES/LESSONS LEARNED

5.1 PRE-CONSTRUCTION SURVEYING

The contract drawings for the Run-On Control Ditch construction, (Sheet 6) of the Contract Documents, contained errors in the existing topography. This resulted in having to construct the ditch by "field-fitting" because no vertical and horizontal control staking could be established. Field fitting the ditch proved a cumbersome task and required multiple field meetings between Schnell and the QA team in order to reach agreement on the final product.

For future contracts at Beal Mountain Mine, it is recommended that pre-design surveying be completed for any areas thought to have errors in the existing survey information. Additionally, if a work item is known to require surveys for determining construction quantities (e.g. pond regrading), it may make sense to complete an initial survey as part of the engineering design process instead of waiting until construction is imminent.

5.2 DAILY CONSTRUCTION OVERSIGHT

During the Project there were several days when the RPR was not on-site. In the case of the Stormwater Pond, Schnell twice moved equipment from the Pond after thinking their work was completed. In both instances, Schnell was asked to complete additional regrading after the RPR returned and deemed the work insufficient. The extra time and cost for re-mobilizing equipment could have been avoided if the RPR were on-site every day.

For future contracts, it is recommended that whenever possible the RPR be available every day. Such availability would help minimize delays and/or increased costs that result from not accepting work in a timely manner.

6.0 REFERENCES

Tetra Tech, Inc. 2012. Construction Specifications, Drawings and Bidding Documents, Beal Mountain Mine Pond Removals and Run-On Control Reclamation Project, Beal Mountain Mine.

APPENDIX A

As-Built Drawings

APPENDIX B

Bid Tabulations

APPENDIX C

Contract Documents

APPENDIX D

Pre-Construction Meeting

APPENDIX E

Daily Constrcution Logs

APPENDIX F

Submittals

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Project Closeout Documents

APPENDIX H

Payment Requests

APPENDIX I

Work Directives and Change Orders

APPENDIX J

Construction Photographs and Photo Log

BEAL MOUNTAIN MINE: POND REMOVALS AND RUN-ON CONTROL RECLAMATION PROJECT

SILVER BOW COUNTY, MONTANA
CONTRACT NO. 413006

Sheet Index

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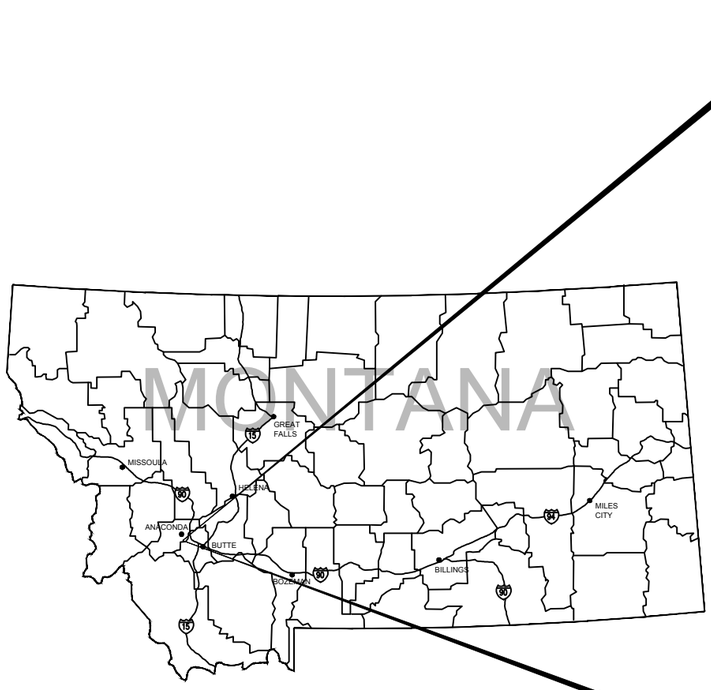
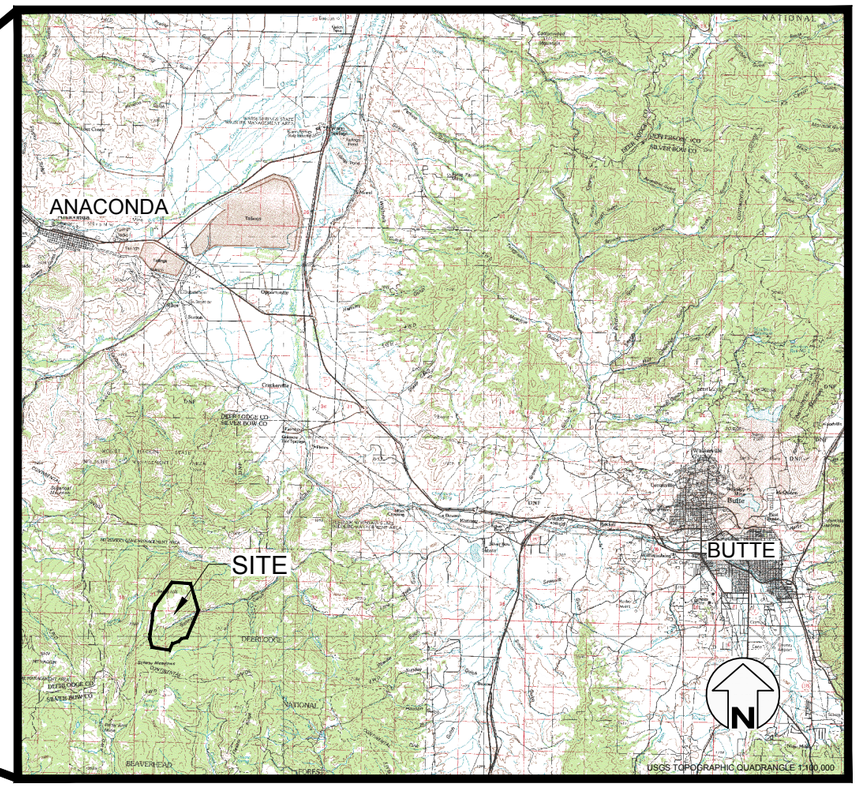
2	Site Plan and Survey Control
3	Minnesota Pond Removal Plan and Profile
4	Storm Water Pond Removal Plan and Profile
5	Contingency Pond Removal Plan and Profile
6	Run-On Control Ditch 0+00 to 6+34
7	Standard Details
8	Drainage Dip Details
9	Run-On Control Ditch Staking Table





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AS BUILT

MONTANA
MWCB

MONTANA
MICHAEL L. HATTEN
No. 16272 PE
LICENSED PROFESSIONAL ENGINEER

REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

Site Location and Sheet Index

TETRA TECH
303 Irene Street
Helena, MT 59601
PHONE: 406.443.5210

PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**
SHEET **1** OF **9**

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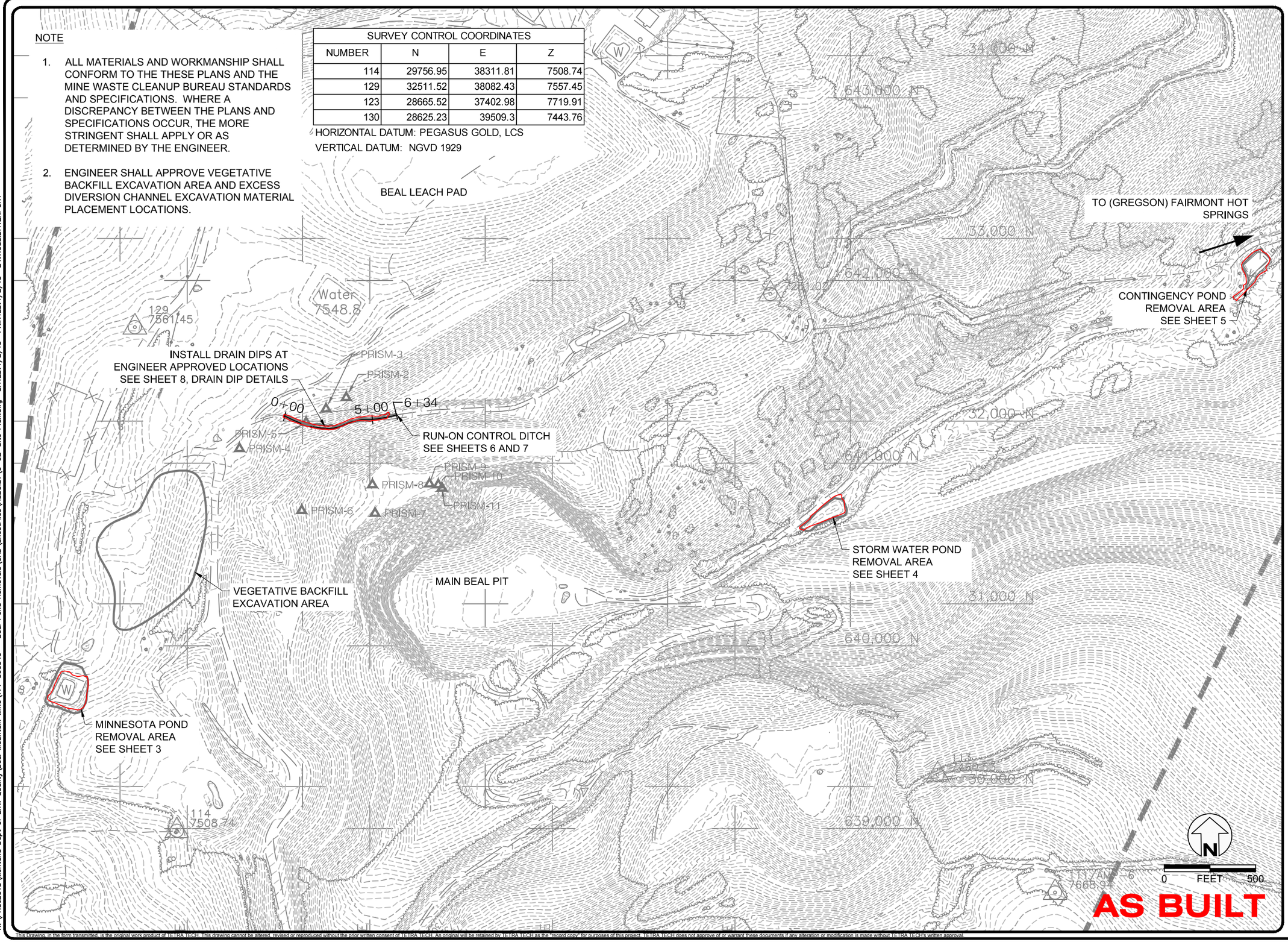
NOTE

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE THESE PLANS AND THE MINE WASTE CLEANUP BUREAU STANDARDS AND SPECIFICATIONS. WHERE A DISCREPANCY BETWEEN THE PLANS AND SPECIFICATIONS OCCUR, THE MORE STRINGENT SHALL APPLY OR AS DETERMINED BY THE ENGINEER.

2. ENGINEER SHALL APPROVE VEGETATIVE BACKFILL EXCAVATION AREA AND EXCESS DIVERSION CHANNEL EXCAVATION MATERIAL PLACEMENT LOCATIONS.

SURVEY CONTROL COORDINATES			
NUMBER	N	E	Z
114	29756.95	38311.81	7508.74
129	32511.52	38082.43	7557.45
123	28665.52	37402.98	7719.91
130	28625.23	39509.3	7443.76

HORIZONTAL DATUM: PEGASUS GOLD, LCS
VERTICAL DATUM: NGVD 1929



AS BUILT

MONTANA
MWCB

MONTANA
MICHAEL L. HATTEN
No. 16272 PE
LICENSED PROFESSIONAL ENGINEER

REVISIONS			
NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

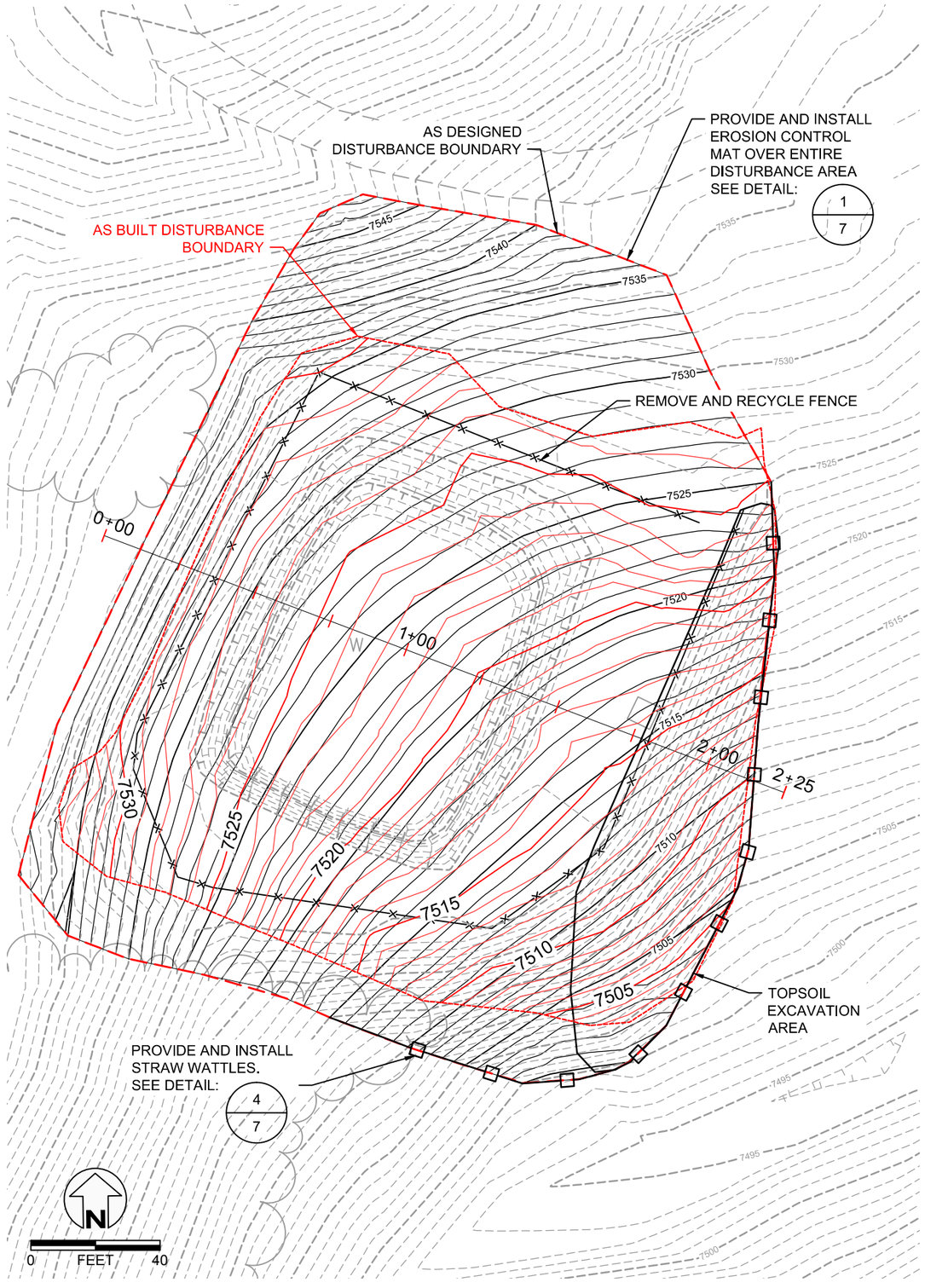
Site Plan and Survey Control

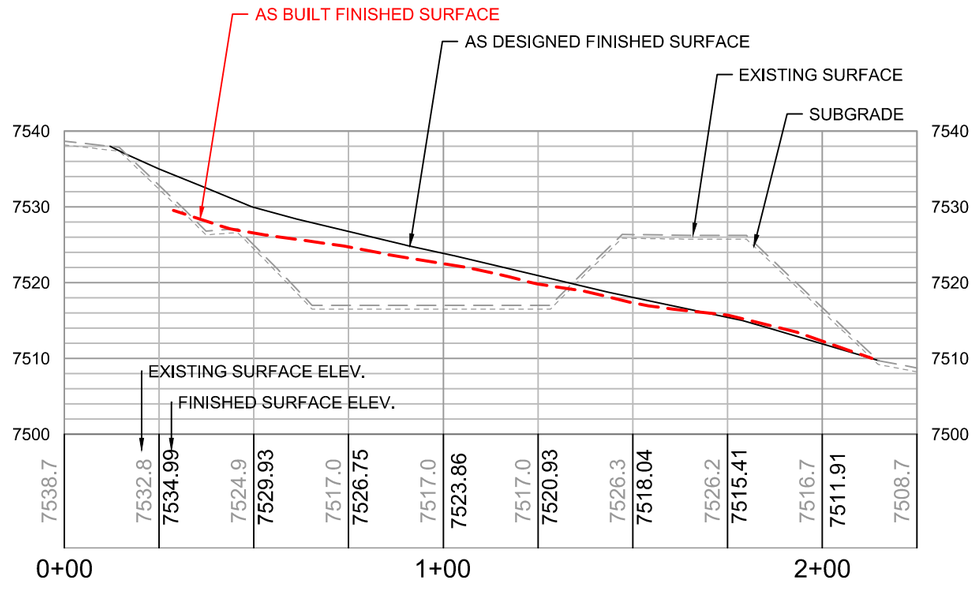
TETRA TECH
303 Irene Street
Helena, MT 59601
PHONE: 406.443.5210

PROJECT NUMBER	**114-560346**
DESIGN BY:	**MLH**
DRAWN BY:	**RED**
CHK'D BY:	**MLH**
APPR. BY:	**MLH**
DATE:	**June 2012**

SHEET **2** OF **9**

N:\PROJECTS\Montana Dept of Env. Quality\Beal Mountain Mine\114-560346 - Beal Pond Removals\CAD\SheetFiles\ASBUILT\C-02-Site Plan.dwg SAVED:1/2/13 PRINTED:1/2/13 BY:ROSS.DAVENPORT





1 / -- PROFILE VIEW - MINNESOTA POND
VERT SCALE = 2X

AS BUILT

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

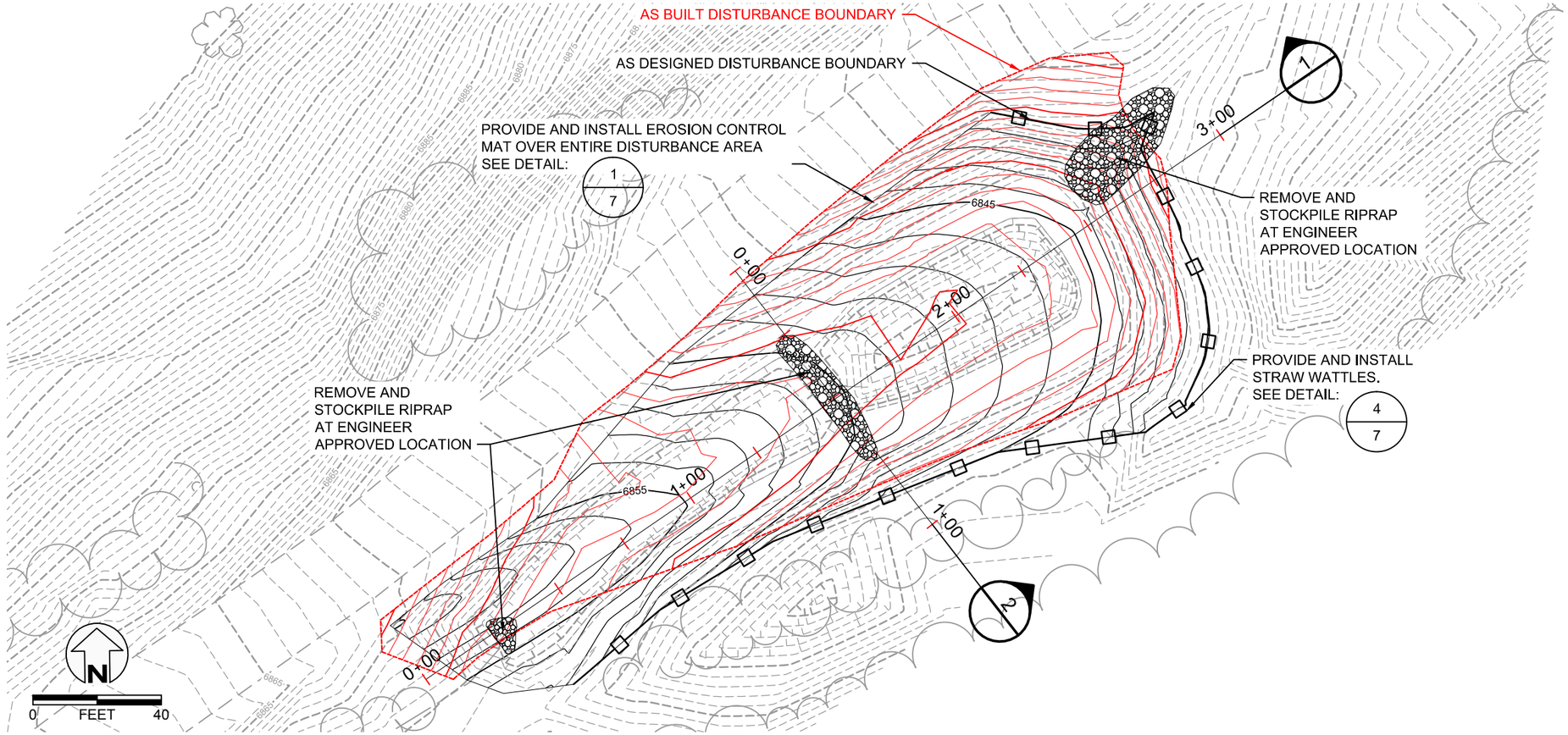
Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

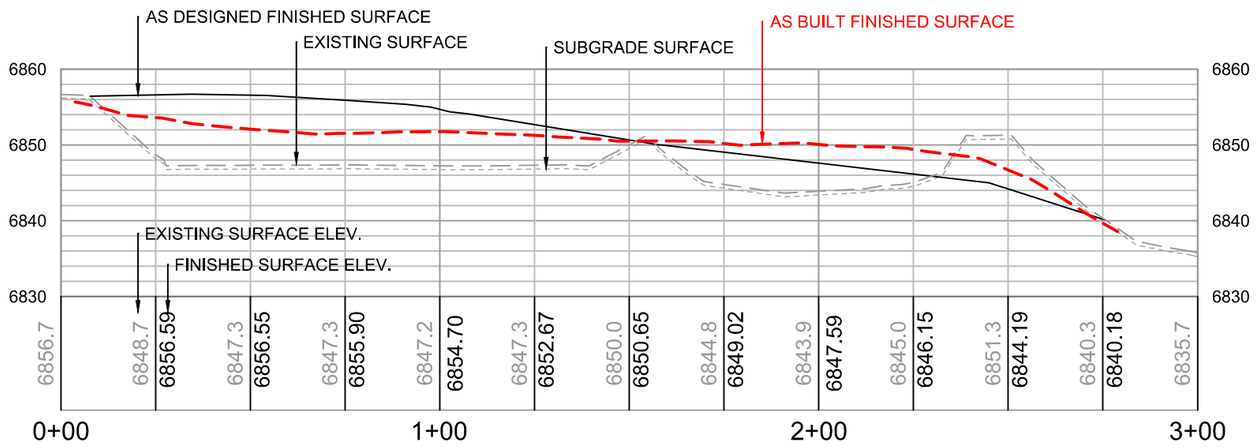
**Minnesota Pond Removal
Plan and Profile**

TETRA TECH

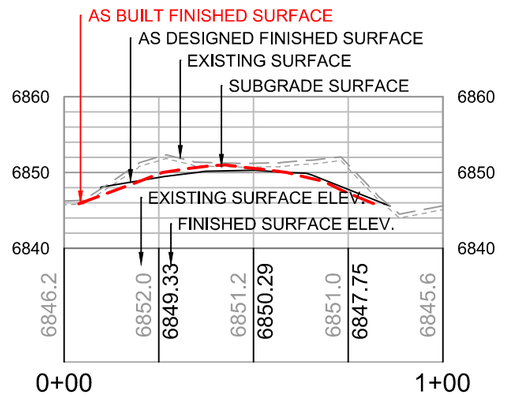
PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**
SHEET **3** OF **9**

N:\PROJECTS\Montana Dept of Env. Quality\Beal Mountain Mine\114-560346 - Beal Pond Removals\CAD\SheetFiles\ASBUILT\C-03-04-05-Pond Removal.dwg SAVED:12/19/12 PRINTED:12/19/12 BY:ROSS.DAVENPORT





1/-- PROFILE VIEW - STORM WATER
VERT SCALE = 2X



2/-- PROFILE VIEW - STORM WATER
VERT SCALE = 2X

AS BUILT

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

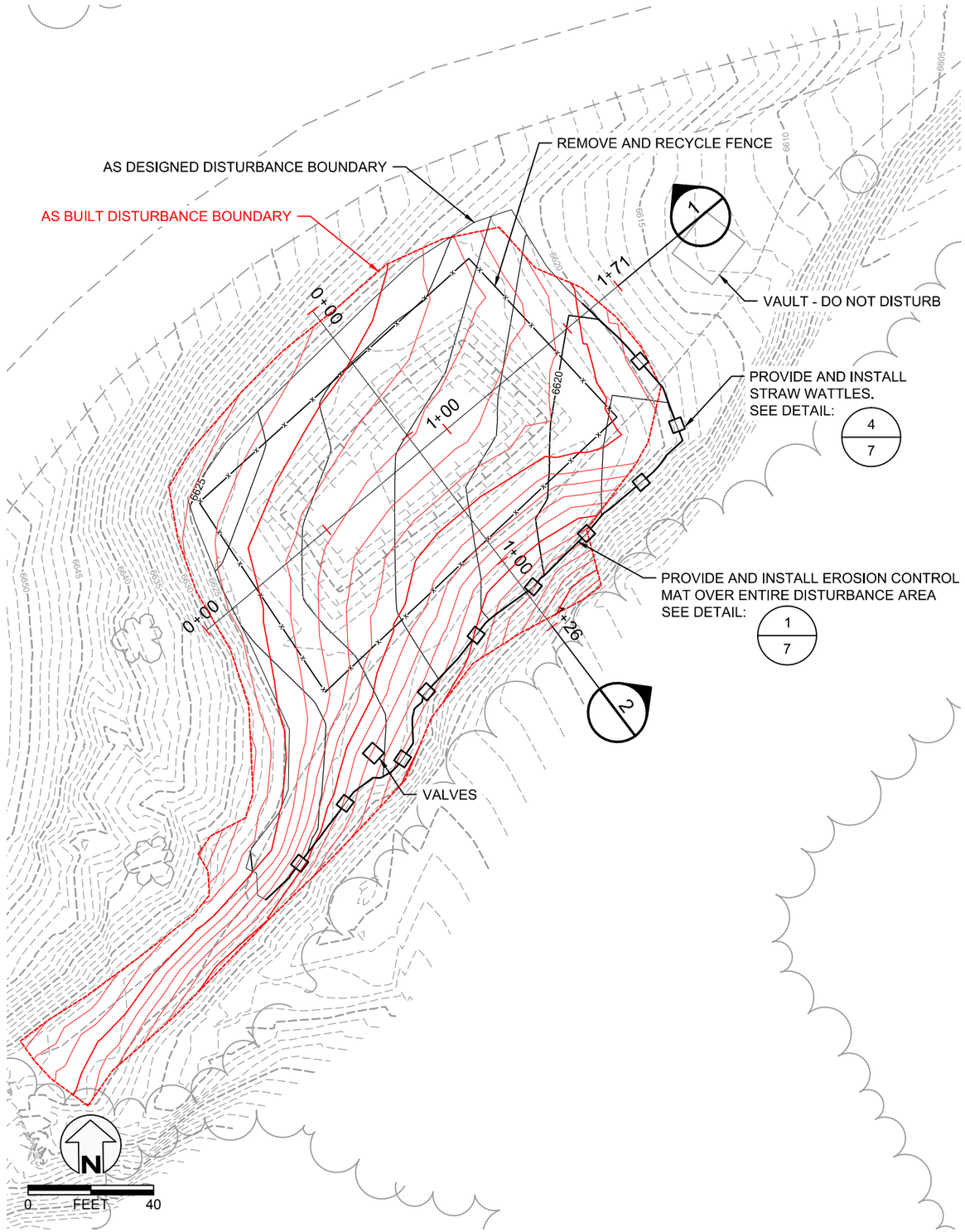
Storm Water Pond Removal Plan and Profile

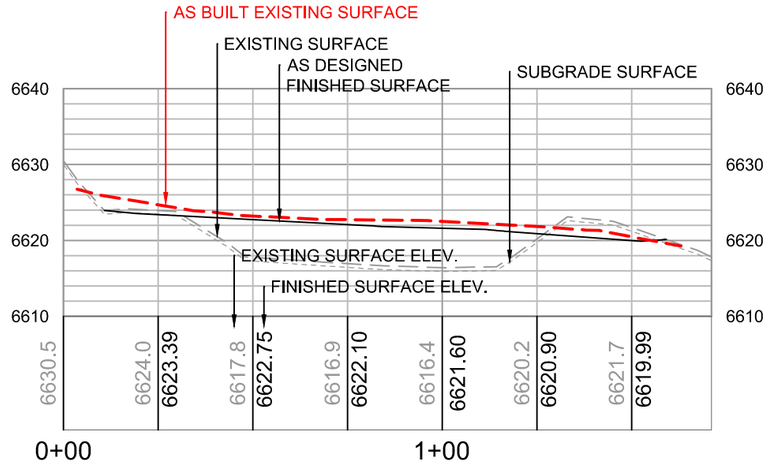
TETRA TECH

PROJECT NUMBER	**114-560346**
DESIGN BY:	**MLH**
DRAWN BY:	**RED**
CHK'D BY:	**MLH**
APPR. BY:	**MLH**
DATE:	**June 2012**

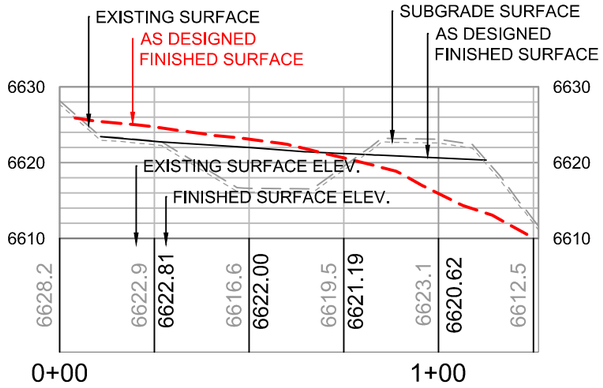
SHEET 4 OF 9

N:\PROJECTS\Montana Dept of Env. Quality\Beal Mountain Mine\114-560346 - Beal Pond Removals\CAD\SheetFiles\ASBUILT\C-03-04-05-Pond Removal.dwg SAVED:12/19/12 PRINTED:12/19/12 BY:ROSS.DAVENPORT





1 -- PROFILE VIEW - CONTINGENCY POND
VERT SCALE = 2X



2 -- PROFILE VIEW - CONTINGENCY POND
VERT SCALE = 2X

AS BUILT

MONTANA MWCB

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine Pond Removals and Run-On Control Project

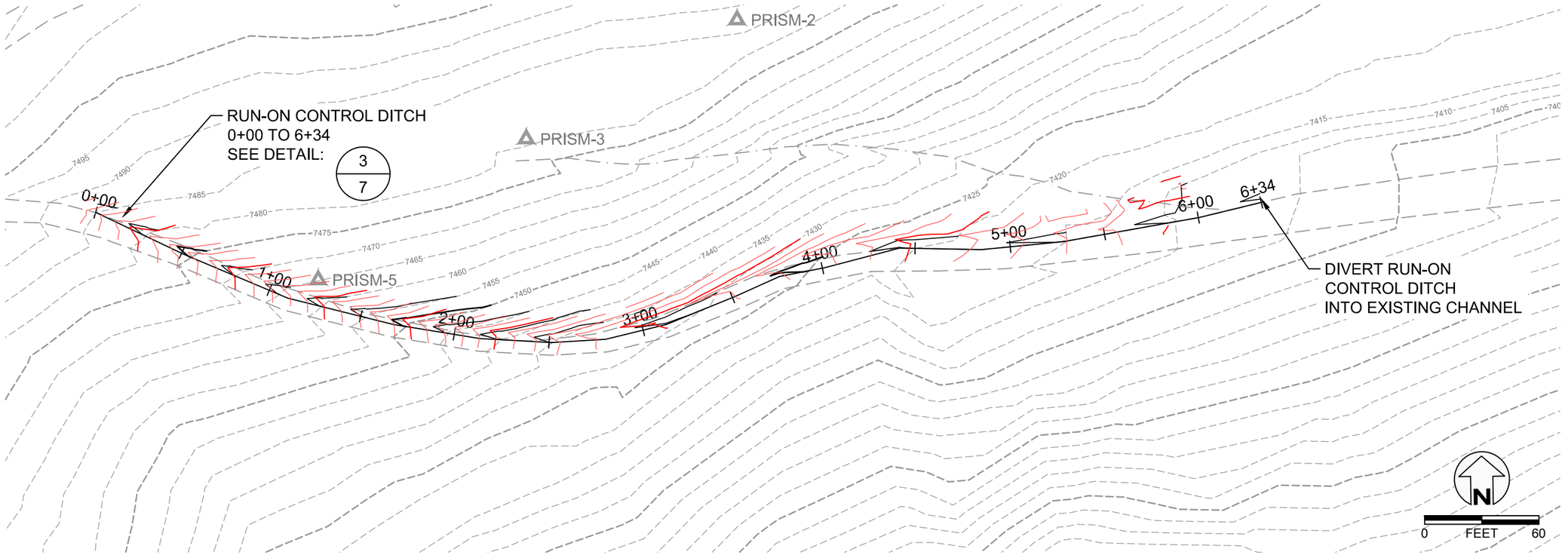
Contingency Pond Removal Plan and Profile

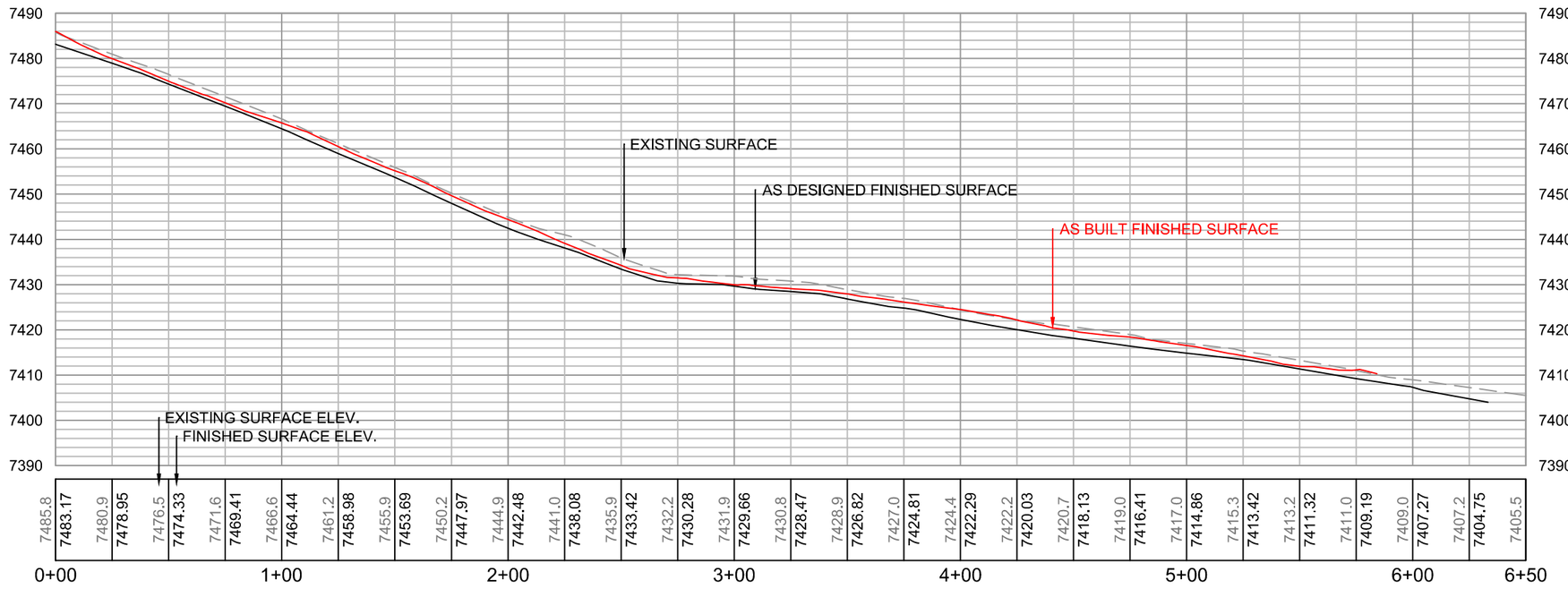
TETRA TECH

PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**

SHEET **5** OF **9**

N:\PROJECTS\Montana Dept of Env. Quality\Beal Mountain Mine\114-560346 - Beal Pond Removals\CAD\SheetFiles\ASBUILT\C-03-04-05-Pond Removal.dwg SAVED:12/19/12 PRINTED:12/19/12 BY:ROSS.DAVENPORT





1 -- PROFILE VIEW - 0+00 TO 6+34
VERT SCALE = 2X

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

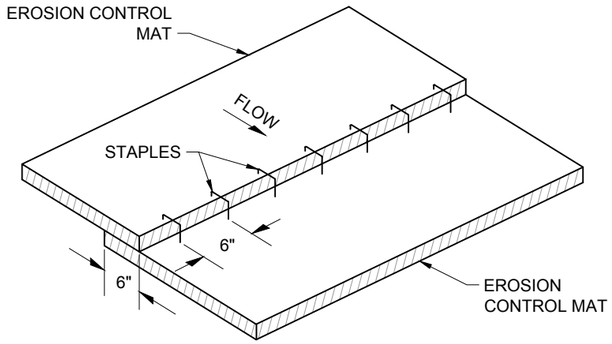
Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

**Run-On Control
Ditch 0+00 to 6+34**

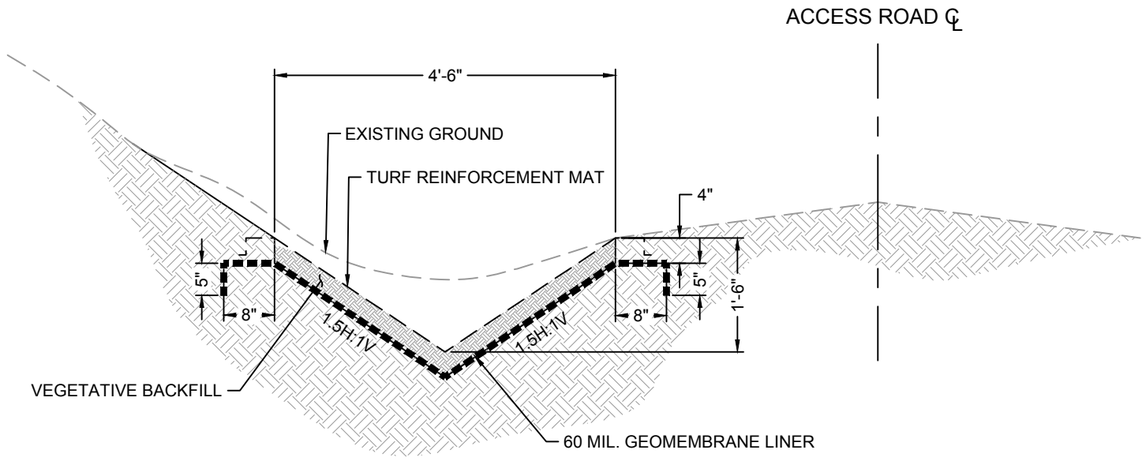
TETRA TECH

PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**
SHEET **6** OF **9**

N:\PROJECTS\Montana Dept of Env. Quality\Beal Mountain Mine\114-560346 - Beal Pond Removals\CAD\SheetFiles\ASBUILT\C-06-Run-On Control Ditch.dwg SAVED:12/19/12 PRINTED:12/19/12 BY:ROSS.DAVENPORT



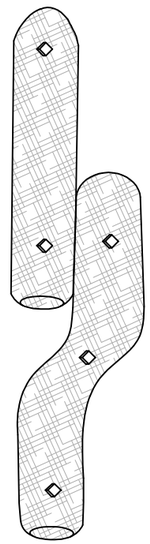
1/7 EROSION CONTROL MAT OVERLAP DETAIL
NOT TO SCALE

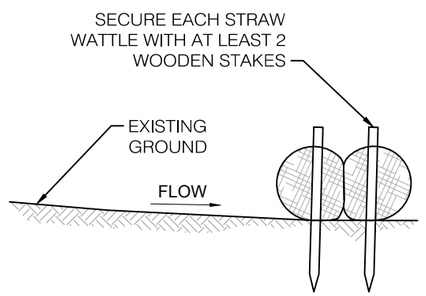


3/7 RUN-ON CONTROL DITCH 0+00 TO 6+34
NOT TO SCALE

NOTES:
1. RUN-ON CONTROL DITCH DOES NOT FOLLOW DIMENSIONS AS DISPLAYED IN DETAIL 3, RUN-ON CONTROL DITCH 0+00 TO 6+34, DUE TO SITE CONSTRUCTION LIMITATIONS AND CUT SLOPE CONDITIONS.
2. KEY TRENCHES WERE NOT CONSTRUCTED IN ACCORDANCE WITH DETAIL 3, RUN-ON CONTROL DITCH 0+00 TO 6+34 DUE TO CONSTRUCTION LIMITATIONS.

2/7 EROSION CONTROL MAT STAPLE PATTERN DETAIL
NOT TO SCALE


PLAN



ELEVATION

4/7 STRAW WATTLE DETAIL
NOT TO SCALE

AS BUILT

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

Standard Details

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PROJECT NUMBER	**114-560346**
DESIGN BY:	**MLH**
DRAWN BY:	**RED**
CHK'D BY:	**MLH**
APPR. BY:	**MLH**
DATE:	**June 2012**

SHEET 7 OF 9

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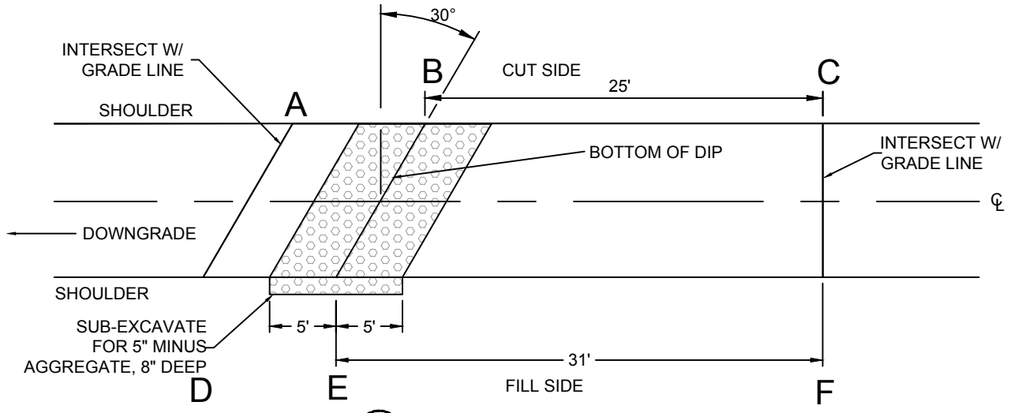
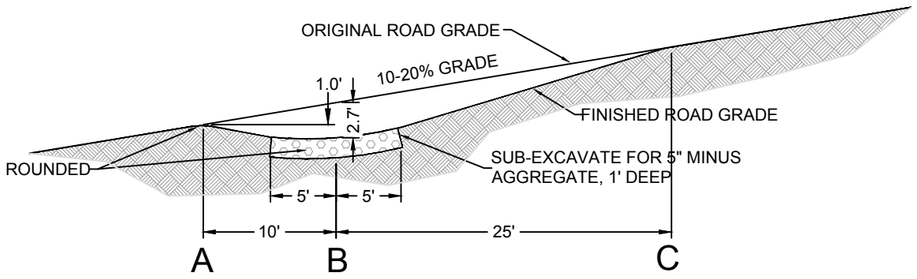
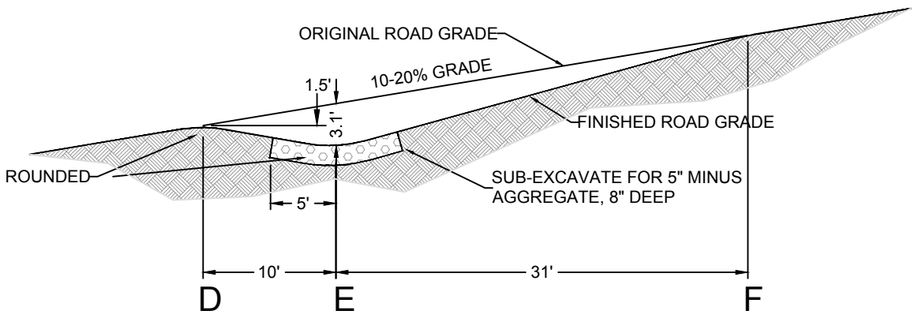


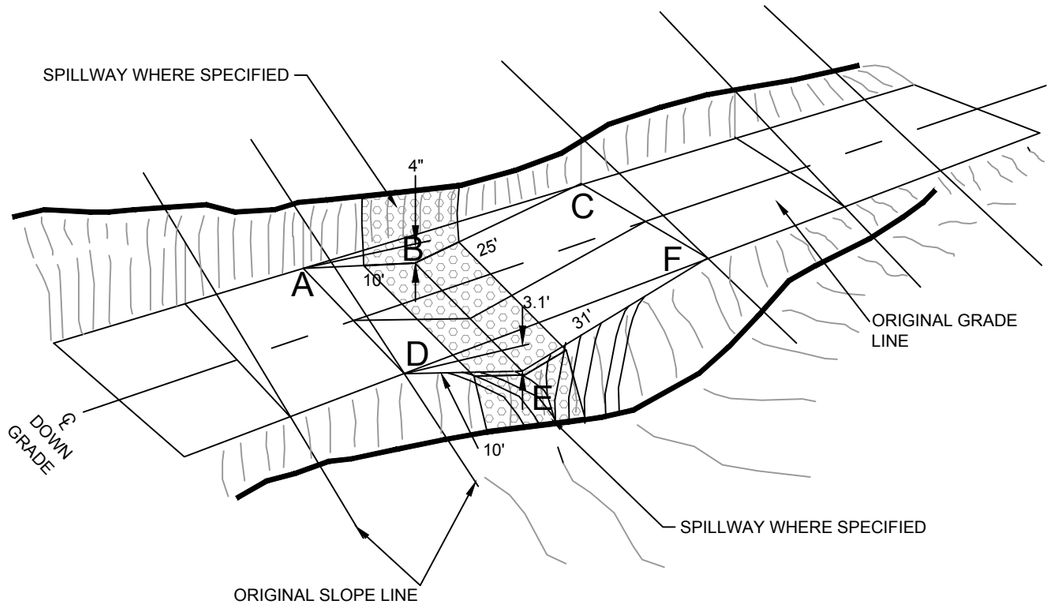
1/8 PLAN OF DRAIN DIP
Not To Scale



2/8 ROAD PROFILE ALONG CUT SIDE OF DRAIN DIP
Not To Scale



3/8 ROAD PROFILE ALONG FILL SIDE OF DRAIN DIP
Not To Scale



4/8 PERSPECTIVE VIEW
Not To Scale

NOTES:

1. FINAL LOCATION OF DRAIN DIPS WILL BE APPROVED BY ENGINEER PRIOR TO CONSTRUCTION OF DIPS.
2. EXCESS EXCAVATION FROM DRAIN DIPS SHALL BE INCORPORATED IN THE ADJACENT ROAD SURFACE. UNSUITABLE EXCAVATION SHALL BE WASTED EVENLY OVER THE FILL, AND ALL DISTURBED AREAS SHALL BE REVEGETATED.
3. VERTICAL CUTS AT "B" AND "E" SHALL BE BELOW THE HORIZONTAL ELEVATIONS OF "A" AND "D".
4. ARMOR MATERIAL FOR DRAINAGE DIPS IS AVAILABLE ON SITE, AT A LOCATION IDENTIFIED BY ENGINEER.

AS BUILT

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

Drainage Dip Details

TETRA TECH
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PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**

SHEET **8** OF **9**

	DITCH EDGE RIGHT		DITCH CENTERLINE		DITCH EDGE LEFT		EXCAVATION DAYLIGHT	
STATION	OFFSET	ELEVATION	OFFSET	ELEVATION	OFFSET	ELEVATION	OFFSET	ELEVATION
0+00	0.00	7484.67	2.25	7483.17	4.50	7484.67	9.12	7488.11
0+50	0.00	7475.74	2.25	7474.25	4.50	7475.76	6.50	7477.43
1+00	0.00	7465.87	2.25	7464.38	4.50	7465.88	6.62	7467.69
1+50	0.00	7455.20	2.25	7453.70	4.50	7455.20	8.94	7458.46
2+00	0.00	7444.02	2.25	7442.53	4.50	7444.01	20.01	7454.76
2+50	0.00	7435.00	2.25	7433.51	4.50	7435.01	14.31	7441.65
3+00	0.00	7431.23	2.25	7429.73	4.50	7431.23	10.91	7435.84
3+50	0.00	7428.45	2.25	7426.95	4.50	7428.46	5.32	7429.37
4+00	0.00	7423.89	2.25	7422.39	4.50	7423.89	5.85	7425.16
4+50	0.00	7419.67	2.25	7418.17	4.50	7419.67	8.49	7422.70
5+00	0.00	7416.40	2.25	7414.90	4.50	7416.40	5.55	7417.47
5+50	0.00	7412.91	2.25	7411.41	4.50	7412.91	5.37	7413.85
6+00	0.00	7408.62	2.25	7407.12	4.50	7408.62	4.63	7409.07
6+34	0.00	7406.52	3.25	7403.99	6.48	7406.19	6.97	7406.82

1/9 CHANNEL ALIGNMENT TABLE

AS BUILT

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REVISIONS

NO.	DESCRIPTION	DATE	BY:

Montana DEQ Beal Mine
Pond Removals and Run-On
Control Project

RUN-ON CONTROL DITCH STAKING TABLE

TETRA TECH
303 Irene Street
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PROJECT NUMBER **114-560346**
DESIGN BY: **MLH**
DRAWN BY: **RED**
CHK'D BY: **MLH**
APPR. BY: **MLH**
DATE: **June 2012**
SHEET **9** OF **9**